

Regulatory Alert TCE Short-Term Action



An ever-increasing number of regulatory agencies

first trimester of pregnancy.

Trichloroethylene

TCE is often found at environmental restoration and VI sites, and it is critical that planning for VI projects take these provisional short-term action levels into consideration by:

- Agreeing upon project-specific action levels and response options;
- Developing an investigation strategy to assess short-term vapor intrusion (VI) risks; and
- Utilizing an effective risk communication strategy.

The implications of these values for VI site decision making are as follows:

- Agencies may consider indoor air exposures to low levels of TCE over a period of only a day to a few weeks to pose a human health risk.
- These provisional short-term action levels can have a significant impact on decision-making at VI sites by potentially triggering high-priority, time-critical, or rapid actions (e.g., temporary re-location, engineering controls, or VI mitigation).
- Short-term TCE indoor air concentrations can be more likely to exceed these action levels since: 1) long-term screening levels and the provisional short-term action levels are similar; and 2) measured short-term concentrations in air are higher than long-term averages.
- Exceedances may be more difficult to detect with sampling, because of the short-term variability in indoor air associated with VI, which could increase investigation costs.
- The short-term action levels are orders of magnitude lower than occupational exposure limits, which creates conflicts between environmental cleanup and worker health and safety programs.
- The uncertainties in the science underlying the provisional short-term action levels create challenges for consensus-driven decisions (e.g., triggers and actions) and risk communication.

Background

One of the conclusions in the 2011 Toxicological Assessment published by the U.S. Environmental Protection Agency (EPA) was that TCE posed a potential human health hazard to a developing embryo/fetus. The developmental toxic effect of fetal cardiac malformations, detected in laboratory animals, was one of three studies used by EPA in developing the long-term non-cancer Reference Concentration (RfC) in air for lifetime (i.e., chronic) exposure. Shortly after, some EPA Regions developed ad-hoc removal action levels (RALs) in air based on short-term exposure to TCE (see Table 1). These RALs have been used to determine the need to implement time-critical removal actions at VI sites. For example, workers were evacuated in March 2012 from three buildings at an EPA Region 3 site after detection of indoor air concentrations higher than the EPA Region 3 provisional RAL of 26 $\mu\text{g}/\text{m}^3$.

Considerable controversy and uncertainties exist about the scientific evidence for fetal cardiac malformations from TCE inhalation exposures. Although many have encouraged implementing a formal scientific consensus and peer review process, regulatory agencies have started developing and using the provisional action levels listed in Table 1 at VI sites. Guidance for how these short-term limits should be used in VI investigations and subsequent remedial/mitigation responses is extremely limited at this time. This makes it difficult for risk managers to determine how much confidence to place in these provisional short-term action levels, while still needing to make decisions.



Dawson, H. and R. Kapuschinski. 2013. *OSWER's Development of Final Vapor Intrusion Guidance. An Overview for the AEHS Vapor Intrusion Workshop*. Presented at the Association of Environmental Health Science Conference, March 19, 2013. San Diego, California.

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Recommendations

The following recommendations have been developed to assist project managers and risk managers in addressing the potential for short-term risks from TCE at VI sites. Information continues to emerge, and updates to these recommendations will be provided as further information becomes available.

1. Agree upon project-specific action levels and response options. These provisional action levels should be used with caution, and in consultation with a risk assessor or toxicologist. Indoor air results could trigger a high-priority, time-critical, or rapid action response in a building. Careful consideration should be given during project planning to the possible response options (e.g. building mitigation, modification of the air conditioning system, temporary relocation of occupants). Short- or long-term mitigation options should be identified during project planning, so these can be implemented smoothly and rapidly, if needed.
2. Have an investigation strategy to assess the defensibility of short-term VI risks. Indoor air sampling results higher than an action level should be followed up with repeat sampling, a few weeks following the initial sampling event, before selecting response options. Additional investigation of background indoor sources should be conducted if elevated TCE concentrations are detected indoors.
3. Develop a risk communication strategy. Identification of stakeholders, including health and safety, legal and public involvement staff, building managers and occupants, is a key element of a strategy. The messages that will be provided to building managers and occupants along with indoor air sampling results should be developed as part of project planning.

Table 1. Summary of TCE Provisional Short-Term Action Levels

Agency	Concentration (µg/m ³)	Exposure Period Considered Significant by Agency	Receptor
EPA Region 3	2	24 hours	Residential
	6 (previously 26)	8 hours	Occupational
EPA Region 9	15	One day (10 hours)	Occupational
EPA Region 10	2	21 days	Residential
	8.4	21 days	Occupational
New Hampshire	2	Not stated	Residential
	8.8	Not stated	Occupational
New Jersey	4	One day (24 hours)	Residential
	18	One day (8 hours)	Occupational
Massachusetts	2	Not stated	Women of child- bearing age
	20	Not stated	"All receptors"
EPA RSLs*	2.1	See below*	Residential
	8.8	See below*	Occupational

*RSL – Regional Screening Levels are based on long term exposures – 25 years for occupational exposure and 30 years for residential exposure. In March 2013, EPA suggested that these RSLs based on non-cancer effects are applicable to short-term exposures.

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